Early Journal Content on JSTOR, Free to Anyone in the World

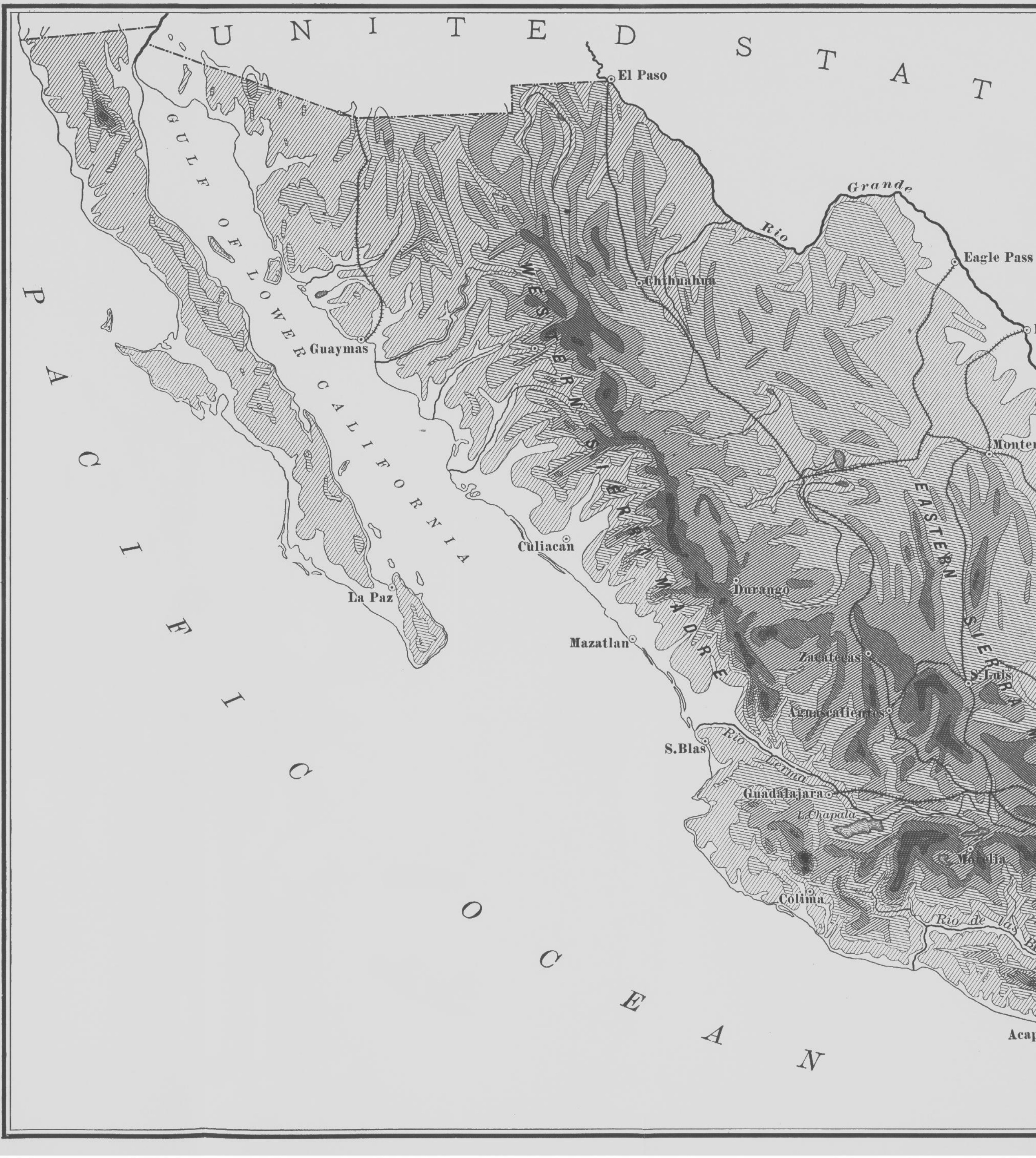
This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

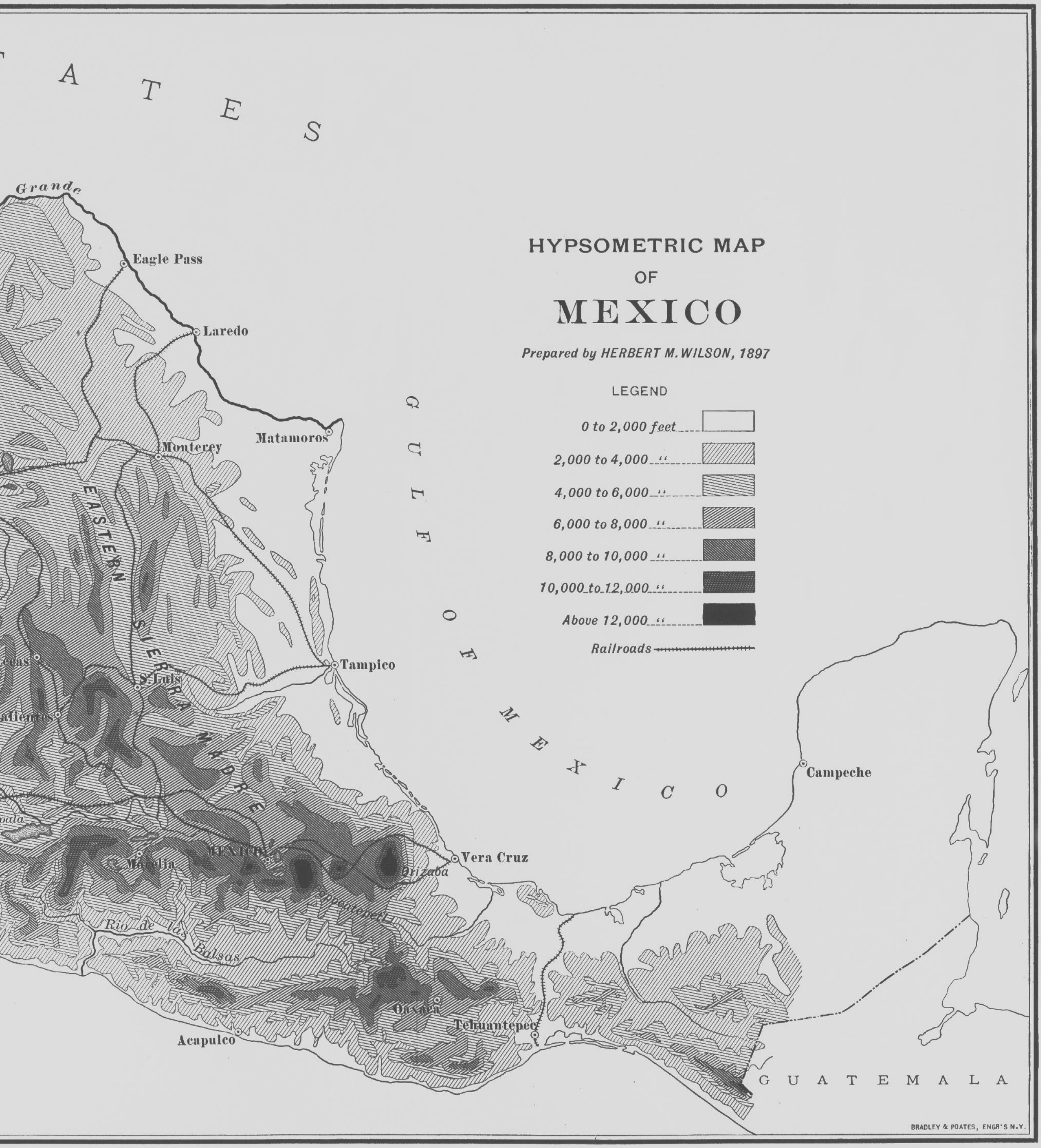
Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.


UNITED STAT
El Paso
GULF OF LOWER CALIFORNIA
PACIFIC OCEAN
Rio Grande
Eagle Pass
Chihuahua
Guaymas
WESTERN SIERRA MADRE
Monter
EASTERN SIERRA
Culiacan
La Paz
Durango
Mazatlan
Zacatecas
S.Luis
Aguascalientes
S.Blas
Rio Lerma
Guadalajara
L. Chapala
Morelia
Colima
Rio de las B
Acap



HYPSOMETRIC MAP
OF
MEXICO

Prepared by HERBERT M. WILSON, 1897

LEGEND

0 to 2,000 feet □
2,000 to 4,000 " ▨
4,000 to 6,000 " ▨
6,000 to 8,000 " ▨
8,000 to 10,000 " ▨
10,000 to 12,000 " ▨
Above 12,000 " ■
Railroads ┼┼┼┼┼

BULLETIN

OF THE

AMERICAN GEOGRAPHICAL SOCIETY.

Vol. XXIX **1897.** **No. 3**

TOPOGRAPHY OF MEXICO.

BY

HERBERT M. WILSON.

Something of the topography and geology of Mexico should be known by all who would understand the geography of the North American Continent, for in Mexico are reproduced and culminate all the characteristic topographic features of the West. A study of the topography of Mexico is a study of her Sierra Madre. Of these mother mountains there are two, the Sierra Madre of the East and the Sierra Madre of the West, and between them lies a great, elevated and irregularly eroded plain, the central basin of Mexico. At the southern extremity of the peninsula these features unite and terminate in a giant group of volcanoes, among which are the highest mountains on the North American Continent.

Geographically Mexico extends in a northwesterly and southeasterly direction for 1,200 miles between latitudes 32° 40′ and 14° 30′. Politically Mexico is divided into twenty-seven States, the Territory of Lower California and the Federal District of the City of Mexico. It contains nearly twelve million inhabitants, or one-sixth the population of the United States; its area is one and one-quarter million square miles, or a little over one-third that of the United States; its average population is about ten per square mile, or less than one-half that of the United States. Within its borders are seventeen cities of over twenty thousand inhabitants each, of which three contain over fifty thousand and two over one hundred thousand inhabitants. The main thoroughfares of Mexico consist of about 6,500 miles of railroads, but little more than sufficient to twice span the distance between New York and San Francisco; and in addition there are a number of good macadamized roads, built chiefly during the days of the Empire.

Both the topographic and geologic features of Mexico are an extension of the western Cordilleran systems of the United States. The ranges of the Rocky Mountains continue across the Rio Grande as the Sierra Madre of the East, and find their ultimate terminus in the neighborhood of Tampico, midway of the eastern Mexican coast. The Sierra Nevada of California and the Basin Ranges of Arizona, after merging and almost disappearing in the deserts about Mohave and Yuma, gain magnitude as they continue in the Sierra Madre of the West to the Rio Lerma, near San Blas, midway of the Pacific coast. Between the two great Sierras Madres is the southern extension of the Cordilleran Plateau of the United States. These two mountain systems unite in Southern Mexico in the group of gigantic volcanoes which extends from the Pacific Ocean to the Gulf of Mexico.

The whole region to the north of this great volcanic scarp is intimately related to the Rocky Mountain and Basin regions of the United States, and has no topographic features in common with the Central and South American region to the south of it. The North and South American Cordilleran systems, if projected from their termini in Southern California and Colombia, would pass each other in divergent lines hundreds of miles apart. Between the termini of these cordilleras, and extending across and at right angles to their trend, is another system of mountains, to which the name "Antillean" has been appropriately applied. This truly Cordilleran range has, as shown by Prof. Robert T. Hill, given to Central America and the West Indies their predominant outlines, a series of giant corrugations having an east and west trend. These mountains are composed of quartzites, eruptives and folded rocks of Paleozoic, Mesozoic and Cenozoic age. The "Bartlett Deep" of the Caribbean Sea, 18,000 feet in depth, and its neighboring banks, have a marked resemblance to the east and west trend of the Antillean mountains, and suggest an evident connection between the mountains of the West Indies and those of Central America.

Let us examine now a hypsometric map of the region just described. This map is reproduced here for the first time. It was compiled by me after three years of laborious correspondence with geographers in all parts of the continent, and after painstaking study of all obtainable writings on Mexican geography. In its preparation there were plotted over 2,000 separate elevations, and those of similar height have been connected by contour lines or lines of equal elevation. Each separate shade here shown represents an additional height of two thousand feet, the lowest or lightest being two thousand feet above sea-level. We thus see that the general level of the basin region is between four and six thousand feet in altitude, and that the sierras which rib it are from two to four thousand feet higher. The summits of the Sierra Madre of the West attain altitudes of ten thousand to twelve thousand feet; those of the Sierra Madre of the East reach altitudes of seven thousand to nine thousand feet; and farther south the valleys are seven thousand to eight thousand feet in altitude, while the higher summits tower to elevations of fourteen thousand to eighteen thousand feet. South of these is the deep trough of the Rio de las Balsas, but little above sea-level; and south of this again, near Oaxaca, the mountain summits attain altitudes of ten thousand to twelve thousand feet.

The mountains of Mexico consist almost wholly of limestone, granite and lava. They are composed chiefly of two classes of rocks, the massive blue limestone of the Cretaceous, beneath and protruding through and overlying which are great masses of lava, diorites, basalts and granites. In places these rocks are bent into innumerable flexures at all angles; again the stratification is almost horizontal; and in some instances even the axis of the mountain masses is directly across the apex of the fold. Lithologically, the hard and dense blue limestone of the Mexican mountains is indistinguishable from the Paleozoic limestones of the Silurian and Carboniferous ages of the European and Appalachian regions. The strata vary in thickness from a few inches to a hundred feet, while their total thickness has been estimated in the eastern Sierra Madre at twenty thousand feet in one section of continuous strata, which was only the lower portion of the great formation observed. This limestone is Lower Cretaceous and belongs to the Comanche series of chalks of Texas.

In the following more detailed study of the topography of Mexico, the method of treatment followed will be to take up first the Central Basin region; next the Sierra Madre of the East; then the Sierra Madre of the West; followed by an examination of the volcanic scarp in which these fundamental features unite; after which we will consider the region south of the scarp which belongs to a separate mountain system. This topographic study will progress logically by taking up each feature from north to south. Finally, we will return to the most interesting and least known of the Mexican mountain systems, the Sierra Madre of the West, and that we may gain a more intimate understanding of its topographic characteristics, will examine these on a cross section from the coast eastward to the Central Basin region.

According to common belief, central Mexico consists of a vast plateau. In fact, it is a great basin or depression ribbed with many irregularly disposed and disconnected mountain ranges, buttes and isolated ridges which are separated by broad valleys and plains. Many of these plains are the beds of ancient lakes, like those of Salt Lake or Humboldt valleys in Utah and Nevada, and have no drainage outlet to the sea. The basin-like character of this central region is accentuated by the mighty mountain barrier of the Sierra Madre which towers above it on the west; by the lesser and more disconnected Sierra Madre of the East; and by the gigantic volcanic cones which dominate it on the south.

A glance at the basin valleys of Mexico, near the northern borders of the Republic, shows that there they have their least altitude and greatest area. Like the neighboring portion of the United States, this region consists of vast desert plains relieved by narrow mountain ridges or the rugged outlines of faulted mesa edges, cut by the many cañons and barrancas which mark the drainage lines of the country. An excellent example of this type of topography is seen in the bolsons west of El Paso. Looking southward across the river at El Paso, toward Juarez, in Mexico, are seen the faint outlines of these bolsons in which are buried the bases of the distant barren mountains. Southward the plains of the Basin region diminish in area, while its desert mountains increase in number and altitude. Toward the geographic centre of Mexico the plains have dwindled to large intra-montane valleys, until finally, in the neighborhood of Zacatecas and Querétaro they are but narrow valleys separating giant mountain ranges.

Toward the northern boundary of Mexico the Sierra Madre mountains of the East attain their least height and are entirely devoid of cordilleran aspect, consisting of isolated ranges and lost mountains, and merging near the neighborhood of the Rio Grande into the desert plains and mesas of western Texas and southern New Mexico. Southward near Monterey they begin to lose their disconnected character and to form a more united and conspicuous mountain mass, and but one hundred and fifty miles farther south, below Victoria, they unite in a superb elevated mass where culminate all the topographic characteristics of the west. To the north the cordilleran type is lost in isolated cerros, the peculiar forms of which are typified by "la Silla" or "the Saddle" near Monterey, which is by far the most conspicuous feature in a mixture of desert plain and jagged hills. The general character of these desert sierras is bold and striking, as is well shown by the names given them. Besides the Saddle there is the Dome, a huge subdued volcanic mass of laccolite, which looks as though a buried giant had raised his back and with it a few miles of the earth's crust; then there are the Knife, the Pillar and the Casket, the fortress-like mass of which is reared above the plain like a great sarcophagus on a mighty mound of *débris.*

To the eastward is an extensive and rugged decline which slopes for fifty miles and terminates in the coastal plain of the Gulf of Mexico, over a mile vertically below. To the south the Sierra Madre of the East continues to rise in stupendous mountain masses which culminate in the volcanic cones of Orizaba and Popocatepetl. To the west are the vast arid deserts of the central basin region, glistening with huge patches of dazzling white, the dried and alkali-incrusted beds of ancient lakes, bristling with a scanty growth of sage brush and cactus, and mottled with rugged mountain forms.

One of the most forbidding of the numerous varieties of cacti which clothe this region is the "ocatea," which resembles a cuttle-fish buried to his nose in the earth, only his arms waving in the air. These are from five to fifteen feet in height, the whipstock arms being without branch or joint, but covered close as they can be set with heavy recurved thorns like tiger's claws, and almost as large. Then there is the "tree yucca," tall, big of trunk and branched like an oak, and bearing on the end of each arm a bunch of bayonet-shaped leaves, the dead stems of which form the bark and are so dry that when lighted the whole flames up like a huge election-night pyre of tar barrels. And finally there is the "pitahaya," mightiest of cacti, which, as single stems or branched, looks like great green telegraph poles or giant candelabra.

The Sierra Madre of the West, like those of the east and the central basin region, are least conspicuous, and attain least altitude near the northern border of Mexico. Along the international boundary the hills are disconnected and without regular system, the highest summits rarely reaching six thousand feet in altitude; thence southward these hills mass together in most irregular and confusing manner, increasing in height and number until in northern Durango and Sinaloa they have assumed cordilleran proportion and height.

Of this system of mountains there is known less, perhaps, than of any other on our continent. Its masses are so grand and numerous that any adequate description of them seems impracticable. Parts of its area are to-day considered inaccessible, and constitute the great topographic *terra incognita* of North America. These mountains are much higher and more extensive in area than are the Sierra Madre of the East, and culminate midway of the length of Mexico in summits exceeding eleven thousand feet in altitude; Frailecitos, near Batopilas, is 9,900 feet in height; La Cuesta Blanca, east of Culiacan, is 11,200 feet in height; and La Cumbre Pinal attains an altitude exceeding 12,000 feet. As they increase in height the crests of the Sierra Madre gradually approach the coast, until in the neighborhood of San Blas rugged mountain faces rise sheer above the ocean to altitudes of two to seven thousand feet. In this neighborhood the mountain groups lose all apparent regularity, and are connected together by passes at different elevations, and have no longer a uniform direction. Still farther south the whole system is interrupted by the deep gorge of the Rio Lerma, the valley of which forms the northern base of the volcanic scarp. This stream drains Lake Chapala, the largest body of water in the Republic, and its ultimate source is in the Valley of Toluca, within a few miles of the City of Mexico.

Turning our attention now to the point in which the two Sierras Madres meet, and by their encroachment on the central basin reduce its desert plains to narrow and picturesque mountain valleys, we find these situated at such an altitude as to give them a climate comparable in many respects with that of our own country, only with a far more uniform annual temperature. These upland valleys of southern Mexico constitute the Mexico of history, romance, commerce and the tourist, and this is truly the garden spot of the American Continent. The valleys are broad and highly cultivated, and through them meander picturesque streams, while encircling them on all sides are superb mountain slopes dominated by gigantic volcanic peaks which tower into the altitudinous region of eternal snow. Here we see well-graded roads, called Caminos Reales, or King's highways; also, numerous farms, picturesque villages and church spires. Still farther south is the Valley of Toluca, the hill slopes about which are highly cultivated, and are girdled by irrigating ditches. In this region luxuriates the maguey, a variety of yucca, from the heart of which pulque, the native Mexican wine, is fermented, and from this is distilled mezcal, a spirituous liquor, richer in alcohol than the brandy or whiskey of our own country. From the leaves of this plant is retted out a strong fibre used in making ropes, and the so-called grass hammocks. Numerous railroads traverse this region, their road-beds skirting in places steep mountain sides or perching on almost vertical rock-walls of ravines and spanning deep cañons.

Close to the City of Mexico is the mightiest of North American mountains, Popocatepetl, the altitude of which is 18,020 feet. The best view of this magnificent peak is perhaps obtained from the Aztec pyramid at Cholula. Near here is the peak of Iztaccihuatl, the altitude of which is 17,290 feet, best seen from the plains of Amecameca. Finally, from the main street in Cordova, is seen Orizaba Peak, 17,870 feet in altitude, most beautiful of all the Mexican volcanoes, and one of which the tourist has an easily accessible view from the line of the Vera Cruz Railroad.

The line of volcanic peaks in which the two Sierras Madres terminate and which forms the southern rim of the Basin region, may be likened to the apex of the letter V, the two arms of which correspond to the general outline of the Mexican cordillera, and here these mountains extend in unbroken mass from sea to sea, terminating precipitately to the south in great escarpments facing the coast and the Valley of the Rio de las Balsas. This is practically the southern terminus of the North American Cordilleran system, the culmination of the mountain grandeur of our continent, having no superior in the world for picturesque beauty.

South of the Rio Balsas is a narrow and precipitous mountain range attaining altitudes of ten to twelve thousand feet and separating the Valley of the Balsas from the Pacific Coast. This range of mountains is fairly homogeneous and continuous to its culmination in Oaxaca, near the Isthmus of Tehuantepec, whence a northern spur connects it around the head of Balsas Valley with the volcanic scarp. At the Isthmus of Tehuantepec this mountain mass falls suddenly to within a few hundred feet of the level of the sea, beyond which the great Antillean system rapidly assumes cordilleran proportions, culminating in a summit exceeding fourteen thousand feet in altitude on the boundary line between Mexico and Guatemala.

In the limited area north of the Isthmus of Tehuantepec are twenty giant volcanoes, including Orizaba and Popocatepetl. Nearly all of these are more or less active and give signs, at least by the emission of gases and vapors, of living fires beneath. Ceboruco, the main crater of which is a pit one thousand feet in depth, was in violent eruption in 1870. Colima, the altitude of which is nearly eleven thousand feet, has been intermittently in eruption ever since Europeans first beheld it, its most vigorous outbursts having been in 1820 and 1870, continuing on each occasion for many years.

The Coastal Plain at the base of the western Sierra Madre in

Sonora is much wider than farther south. It is broken by rugged and precipitous mountain ridges separated by broad deserts, and these are traversed by the boulder-strewn paths and dry washes of the streams which drain the western cordilleran slopes. The topography of this region is well exemplified in the coast west of Hermosillo. This is striking by reason of the ruggedness of the mountain ranges, which rise steeply from great apron-like expanses of plain. The precipitous mountain reefs seem half buried in vast torrential deposits, which on close inspection are found to be but a thin veneer overlying planed rock strata. These igneous mountains are but a few miles in width and rise abruptly from the coast to altitudes of five thousand feet. They are frequently butte-like in outline, great uplifted strata of volcanic rock sheltering their summits like upraised piano covers. The inland faces are but a few hundred feet high and too steep to be climbed, while the gulf sides drop away sheer for a thousand feet. The prevailing rocks of the principal ranges are Mesozoic or early Tertiary lavas, while there are large areas of more ancient granites interspersed with dikes of trap.

The flora of this region is even more sparse than that of the deserts of the interior basin. Conspicuous among it are all varieties of cacti, the great "tuna" or prickly pear, the fruit of which is eaten fresh, or dried and made into tuna bread. Other varieties are the giant "saquasa" or water cactus, the venomous "cholla" and the wide-branching "pita-haya." The prevailing trees are little more than shrubs, among which are mesquite, catclaw, paloverde and other thorny bushes. The fauna of this region includes the jack-rabbit, coyote, black-tailed deer and peccary, on the plains; and in the mountains big horn, mule deer and jaguar; while sluggish Gila monsters, tarantulas, scorpions and rattlesnakes keep the traveller alive to the necessity of watchfulness in his movements.

A better understanding of the Sierra Madre of the West can probably be got by making an imaginary journey across them. Assume this to begin on the west coast in the State of Sinaloa, cross the highest summits of the Sierras over one of its few passable trails, and descend thence into the great central basin in the neighborhood of Durango. The coastal plain at this point is forty miles in width, and in this distance rises but 100 feet with nearly uniform grade. The floor of this plain resembles a great green-topped billiard table, tilted up against the foot-hill slopes of the Sierras. For ten miles back from the coast it is indented by numerous lagoons and its soil, which is of sand and alluvium, supports a dense growth of thorny jungle, interspersed with graceful palms and dwarfed and stunted hardwoods. Among the numerous clearings and open spaces in this jungle are small villages and great cattle ranches, each with its rudely constructed corral. Here chief among the scenes of interest are the "vaqueros" or cowboys, busied in rounding up horses and cattle or in branding and otherwise working with them.

Let our imagined journey start from Culiacan, the capital of the State of Sinaloa, and a thriving city of several thousand inhabitants. This is situated at the base of the Sierra Madre, surrounded by cultivated fields, hardwood forests and cactus jungle. In the journey eastward from this point the route quickly leaves the "tierra caliente," or tropic region, to toil up rugged heights to a more congenial climate.

Near Culiacan the wide flood plain of the Culiacan River is entered as it emerges from the encroaching foot-hills. The river bed is here of great width, and through it the stream meanders between steeply eroded alluvial banks, an inspection of which shows that in times of flood this river assumes immense torrential proportions. The natives whose thatched adobe houses are passed are of the peon class, true serfs in that they are generally in debt to their employers, who are thus able to claim their services at will. These people are generally mestizos or half-blood Indians, who wear leather sandals attached to the feet by thongs, and a pair of trousers and blouse of white cotton cloth. As they journey about the country they carry with them their sole possessions, a bright-hued "serape" or blanket and an "olla" or earthen jar in which to cook their frugal meal of "frijoles," a dish which is first cousin to Boston beans. The ranches are fenced by great growths of "pita-haya," which are easily and cheaply constructed by planting cuttings in a row like posts, where they readily take root and grow to enormous proportions.

Among the lower foot-hills are numerous ranches, the staple products of which are corn, sugar-cane, tobacco and cotton. Here luxuriate oranges, figs, limes, bananas and guava apples; also maguey, beans and tomatoes, the cultivation of all being facilitated by irrigation. The fauna here is similar to that of the coast, but the flora changes rapidly; cacti and thorny bushes disappear and in their places are extensive forests of precious hardwoods, including magnificent specimens of ironwood, rosewood, mahogany, ebony and lignum vitæ, with trunks 10 to 20 inches in diameter and 20 to 60 feet in height. Here flourish also logwood and guisachi, the first of which is exported extensively, while the latter is prized for the large amount of tannic acid which its sap contains; besides there are gum-copal and agua-pepi, the ashes of which make rich soap lye. As an instance of the abundance and cheapness of the hardwoods, I may state that all the ties of the Sinaloa and Durango Railroad are of them, and that they were delivered at the road for seventy-five cents apiece. Farther in the mountains the river gorge narrows, the mountain slopes on either side encroaching more closely and rising more abruptly until, at an elevation of three or four thousand feet, it has diminished to a small torrential stream which flows with steep grades over a rough-hewn and boulder-strewn channel. Here the trail leaves the stream, and winding up the confining slopes brings us upon the surrounding ridges at an elevation between four and five thousand feet, in the region of oaks, the beginning of the "tierra templada" or temperate zone.

Owing probably to some peculiar property of the water, which stains all the boulders of the river channel a yellow ochre, a startling proportion of the people here are what the Mexicans call "poco loco," meaning mildly idiotic or imbecile. Moreover, a still greater proportion suffer from goitre, a disease which attacks even the comparatively young. In one valley in this region is quite a colony of albinos, thin, pinkish-white skinned and sandy-haired Mexicans, a complexion and color which seem absurdly out of place among the dark-skinned people of the South.

Leaving the river gorge in the neighborhood of Canelas, the way enters one of the most magnificent regions in the world. The Valley of Canelas is situated at an altitude of about 4,500 feet. Its floor is like the bottom of a teacup, surrounded on all sides by a mighty rim, the crests of the Sierras, which rise to heights of three to five thousand feet sheer above it. Here the climate is ideal; the temperature from year-end to year-end rarely exceeding 65 degrees as a minimum and 80 degrees as a maximum. Here grow in luxuriance all semi-tropic fruits and vegetables—the orange, fig, pomegranate, guava apple and lime; also the aguacate, or alligator pear, and the chirimoya, or custard apple—most delicious of all fruits. Side by side with these are cherries, apples, peaches, plums, pears and grapes; potatoes, cauliflower, wheat, oats and other of our home vegetables and grains. This is the centre of a rich mining region, and from it are packed to the coast on burro and muleback great quantities of silver ore, which exceed in richness the product of nearly any mining region in North America. In addition to these silver ores there are, near Culiacan, large deposits of hematite and magnetite, iron ore; also copper and cinnabar or mercury ore; and tin and gold placer deposits nearer the Sierra summits.

Beyond Canelas the trail winds up steep and rugged slopes to the "tierra fria," or frigid zone, eight to ten thousand feet above the sea-level. Here are immense virgin forests of cedars, pines, firs, oaks and other of our New England woods. And here let us pause, on the crest of "La Cumbre," the summit of the Sierras, after the arduous four-thousand-foot climb, to feast our eyes upon the grand panorama displayed to the westward. Looking down over rugged mountain slope and distant low-lying plain, there is caught on the dim horizon a glint of the setting sun reflected upon the waters of the Pacific. Between it and the immediate foreground is a vast expanse of irregularly tumbled and confused mountain ranges and deep gorges. At our very feet is the village of Canelas, so near that it would seem as though we could cast a stone upon the house-roofs, a full mile vertically below. And as we stand and shiver, our feet embedded in the newly-fallen snow, we can clearly see the pink and golden hues of pomegranate and orange, products of a more gentle and balmy clime.

Resuming our imaginary journey, this is now for many miles through grand forests of conifers and picturesque little valleys, the floors of which are carpeted with a luxuriant growth of grass, through which meander in idle curves limpid mountain streams. Again the trail crosses low mountain ridges, separating the park-like valleys or skirts the rocky walls of mighty "barrancas," the precipitous depths of which seem to have been carved in the mountain side by a giant knife. This region is a veritable sportsman's paradise; wild turkeys are abundant, and deer are frequently seen and approached without difficulty, while the stillness of the camp-fire watches is broken by the grunt of a bear, the frequent and sonorous howl of the grey wolf, or the metallic scream of the jaguar. In some of these barrancas are magnificent water-falls. Those of Bassascachi are perhaps the highest and most fairy-like in their outline. Elsewhere the Falls of Regla tumble over queerly-shaped basaltic columns, while one of the largest and most imposing falls in Mexico is the cataract of Juanacatlan.

At last the Sierras are crossed and the way leads down their eastern slope into the drier climate of the Central Basin region. Behind are monster mountain masses, bare of verdure and carved by erosion into many and confusing forms, while to the distant north is a fortress-like butte, in front of which stands a lone and sentinel rock of massive proportions, "El Pilar," well named the "pillar," one of the most striking freaks in a unique region.

Finally, the Sierras are left far behind, and descending a few thousand feet the trail now winds through valleys six to seven thousand feet in altitude and over rough mountain passes into the barren Central Basin. Here are some of the silver mines which abound in all the country west of the Mexican Central Railroad. These mines are usually situated well up in the gorges of the mountains, and each is marked by a little village of modern buildings. The total production of silver in Mexico exceeds that of any country in the world excepting the United States, and last year alone amounted to sixty millions of dollars. It is estimated that the total output of silver since the occupation of Europeans has been three thousand five hundred millions of dollars.

And now our imaginary journey nears its terminus, the City of Durango, where we behold the massive proportions and sombre hues of the celebrated "Cerro de Mercado," the huge box-like summit of which is of purest iron ore, resting on a great stratum of limestone. The fragments of the iron cap which form the *débris*-strewn talus would furnish the already mined charge for a score of blast furnaces for many years, while the main mountain mass is probably the greatest body of accessible iron ore in the world. The value of this deposit can be realized when we consider that it occurs in close association with the necessary limestone flux.

H. M. W.